Is there any synchronism between the business cycles of Argentina and Brazil?[a]

Existe alguma sincronização entre os ciclos econômicos da Argentina e do Brasil?

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Abstract: This paper explores the behavior of business fluctuations in Argentina and Brazil over the last quarter-century. Argentina exhibits greater volatility, with its economic fluctuations being two and a half times more intense than those of Brazil. Although the concordance between both economies is 60%, the countries are weakly correlated. Argentina's contemporary GDP is influenced by and retains information from two previous quarters. As for the components of GDP, Consumption and Gross Capital Investment are more volatile in Argentina. The Trade Balance exhibits low relative volatility and plays a countercyclical role in both countries. Although the economies show some interesting parallel variations, remaining simultaneously in the same phase of the economic cycle, the volatility of one of the main economies, together with the weak correlation of business fluctuations, suggests that the successful application of homogeneous macroeconomic policies is still distant.

Keywords: Business Fluctuations. Argentina. Brazil.

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Resumo: Este artigo explora o comportamento dos ciclos econômicos da Argentina e do Brasil ao longo do último quarto de século. A Argentina apresenta maior volatilidade, e suas flutuações econômicas são duas vezes e meia mais intensas que as do Brasil. Embora a concordância entre ambas as economias seja de 60%, os países apresentam fraca correlação. O PIB contemporâneo da Argentina é influenciado e retém informações de dois trimestres anteriores. Em relação aos componentes do PIB, o Consumo e o Investimento Bruto de Capital são mais voláteis na Argentina. A Balança Comercial apresenta volatilidade relativamente baixa e exerce seu papel anticíclico em ambos os países. Embora as economias apresentem algumas variações paralelas interessantes, permanecendo simultaneamente na mesma fase do ciclo econômico, a volatilidade de uma das principais economias, juntamente com a fraca correlação das flutuações econômicas, sugere que o sucesso da implementação de políticas macroeconômicas homogêneas ainda está longe de ser alcançado.

Palavras-chave: Flutuações econômicas. Argentina. Brasil.

JEL: E30. E32.

1. Introduction

The analysis of the business cycles is important for several reasons. On the one hand, it is essential for governments as it facilitates the appropriate implementation of their policies (i.e. understanding the dynamics of Gross Domestic Product (GDP) and its components allows for more effective macroeconomic outcomes). On the other hand, when economies share similar characteristics, common macroeconomic policies have a greater chance of success.

Unsurprisingly, the analysis of symmetries in countries' macroeconomic performance emerged in the 1990s when several regions worldwide were involved in various integration processes. Specifically, a certain degree of homogeneity among their economies is an important requirement for the application of uniform macroeconomic policies (Christodoulakis *et al*., 1995). It must be highlighted that Mundell's (1961) seminal work on Optimum Currency Areas (OCA) has opened this new path of research focused on the synchronism of business fluctuations between economies attempting to form a monetary union. As known, a high level of synchronism is required to generate greater benefits for OCA members in comparison to the costs arising when they relinquish their independent monetary policies.

Regarding Latin America in general, the existing studies have suggested the absence of common fluctuations, although some homogeneous macroeconomic behavior has been observed for a subset of countries within the region (among others: Arnaudo; Jacobo, 1997; Mejía-Reyes, 1999; Jacobo, 2022; Gómes; Gutiérrez, 2006; and, more recently, Jacobo; Marengo, 2022).

This paper performs a short — albeit important — statistical exercise and tries to document the existence of similarities in the economic fluctuations of Argentina and Brazil. Its aim is to observe the coincidence, persistence, and volatility in the GDP and its components for both economies during the period 1997.I-2022.IV. These countries are the two main trading partners of the Southern Common Market (MERCOSUR is the Spanish acronym for this integration agreement). The period covers the years following the Asunción Treaty (when the agreement was implemented) bearing in mind that positive results took time to emerge and extends until the latest available data. The study's contribution is twofold. Firstly, it updates previous works on the subject. Secondly, the statistical

analysis allows for the prediction of the likely outcome of the integration process as well as the application of uniform economic policies.

The rest of the study is structured as follows. Section 2 briefly lists the most relevant literature. Section 3 presents the methodology. Section 4 shows the results. Finally, Section 5 makes some concluding remarks.

2. Literature overview

We briefly reference some studies that have marked milestones in the theoretical history of business cycles as well as those works that have contributed to estimate the cycles (subsection 2.1). Subsequently, we provide an overview of the empirical studies that specifically address with business cycles in Argentina and Brazil (subsection 2.2).

2.1 Business cycles and their estimation

The initial inquiry concerning business cycles revolved around their causes. Early explanations were rather simplistic, attributing them, among other reasons, to sunspots, investment cycles, or political cycles. It was not until after the Great Depression of the 1930s that more in-depth explanations began to be sought, a quest significantly influenced by the work of Burns and Mitchell (1946).

Indeed, in their seminal book, these authors defined business cycles as a type of fluctuation in aggregate economic activity, characterized by cyclical movements through four stages: upturns, expansions, recessions, and contractions. This definition activated a series of studies on business cycles that have since attracted the attention of numerous economists. Over time, these studies have shaped the various explanatory lines of the business cycle, which we tend to outline below.

First, it is worth mentioning the Keynesian perspective, which posits that business cycles stem from endogenous elements (Keynes, 1937). From this viewpoint, effective demand could be lower than total supply due to various factors (e.g. the ‘psychology’ of economic agents), a circumstance that leads to lower or unstable consumption. Consequently, a shortfall in effective demand was identified as the primary cause of the business cycle.

Second, the contribution of the Monetarists is noteworthy. They argue that business cycles are consequences of changes in aggregate demand, specifically resulting from unanticipated changes in the money supply (Friedman and Schwartz, 1963). Indeed, when the money supply fluctuates, money demand remains stable in the short term, leading to changes in relative prices. Through (adaptive) expectations, agents adjust their spending to these new prices, thereby inducing variations in the business cycle.

Third, we consider the rational expectations hypothesis, according to which agents form their expectations based on all available information. Under this view, monetary illusion (changes in the money supply with incomplete or unavailable information) becomes a source of exogenous shocks (via price variations) to aggregate demand, thereby generating business cycles (Lucas, 1972).

Fourth, technological shocks have emerged as an explanation for business cycles (Kydland and Prescott, 1982). In this case, fluctuations are caused by real (rather than nominal) factors, giving rise to the theory of Real Business Cycles (RBC).

Finally, New Keynesian theorists integrate elements from the original Keynesian school with rational expectations and Real Business Cycle theory, while assuming various market imperfections. For them, both demand and supply shocks play a crucial role in determining business cycles. As Romer (1996) points out, the New Keynesian objective is to develop a single model that captures the strengths of RBC while also allowing the possibility that monetary shocks can have real effects on the economy and provoke cyclical fluctuations.

To summarize, there appears to be no single force driving business cycles, but rather a consensus that both aggregate demand and supply play a relevant role, and that any comprehensive interpretation of business cycles necessarily requires considering a range of factors.

With the evolution of economic theory and the advancements in statistics and econometrics, various works have contributed to modeling business cycles. These include the Dynamic Factor (DF) model, the regime-switching or Markov Switching (MS) model, and the Real Business Cycle (RBC) model. More recently, these have been complemented by Vector Autoregression (VAR) and Dynamic Stochastic General Equilibrium (DSGE) models. While a comprehensive

description of these methodologies is beyond the scope of this paper, some illustrative comments follow.

DF models, proposed by Geweke (1977) extend factor models previously developed for cross-sectional data to time series. The premise of DF models is that the covariation between time series variables (considering both leads and lags) can be attributed to a few unobserved underlying series, referred to as factors. Consequently, DF models decompose the evolution of a set of economic time series into the sum of two components: common factors and idiosyncratic ones. Although DF models have generated extensive literature, one of their earliest applications to macroeconomic data was by Stock and Watson (1989, 1991).

Markov Switching (MS) models are time-series models where parameters change over time across different regimes, with an unknown timing and number of switching points. The results obtained from MS models are characterized by their reproducibility and the relative validity of their predictions. Consequently, the MS model is widely used to identify inflection points and asymmetry in the business cycle.

Given the non-stationary characteristics of time series, Hodrick and Prescott (1997) proposed a filtering method (known as the H-P filter) to separate long-term trends from short-term economic fluctuations. Due to its simplicity — among other advantages — it has proven to be effective and widely applied. Subsequently, other frequency-based methods, such as the BK filter proposed by Baxter and King (1999) and the CF filter by Christiano and Fitzgerald (2003) were considered as substitutes for the H-P filter.

The BK filter employs a band-pass to separate trend-related elements from cyclical ones. This enables the isolation of fluctuating components at specific frequencies, with its advantages being particularly evident when working with high-frequency data. The BK decomposition divides time series into three parts: high-frequency irregular disturbances, low-frequency growth trends, and intermediate-frequency business cycle fluctuations.

The CF filter also aids in separating the trend component from the cyclical one, especially when working with finite-length data. It serves as a finite-length approximation to the ideal band-pass filter, minimizing the mean square error between the ideal filter and its approximation.

It should be noted that, in general, the H-P filter functions similarly to a high-pass filter, whereas the BK and CF filters are band-pass filters. High-pass filtering is typically used to dissect economic time series into components with wavelengths shorter than 8 years, while band-pass filtering is employed to isolate business cycle fluctuations characterized by wavelengths spanning 6 to 32 quarters.

Regarding Vector Autoregressions (VARs), Sargent and Sims (1977) and Sims (1980) proposed them to enhance the theoretical credibility of macroeconometric models. Their application does not rely on strict economic theory but instead allows data relationships to drive the explanations of the results. Blanchard and Quah (1989) extended this framework by proposing the Structural VAR (SVAR) model. The SVAR model incorporates several structural constraints to obtain a unique structural relationship, thereby addressing the identification problem and lending economic significance to the impulse responses.

Finally, numerous authors employ the Dynamic Stochastic General Equilibrium (DSGE) approach to study economic fluctuations. DSGE models are constructed by integrating intertemporal optimal choices and exogenous random disturbances within a general equilibrium framework. The earliest DSGE model is the Real Business Cycle (RBC) model, developed by Kydland and Prescott (1982) to study the characteristics of macroeconomic variables in the United States.

2.2 Business Cycles in Argentina and Brazil

For Argentina, the stylized facts of economic fluctuations have been analyzed by Kydland and Zarazaga (1997), Cerro (1999), Jorrat (2005), Díaz (2007), and Rojas and Zubimwendi (2009). For Brazil, notable contributions include Val and Ferreira (2001), Ellery, Gomes, and Sachsida (2002), Neumeyer and Perri (2005), and Souza-Sobrinho (2010). Other studies focusing on symmetries or asymmetries in business cycle phases in Latin America generally comprise those by Engel and Issler (1993), Arnaudo and Jacobo (1997), Mejía-Reyes (1999), Cerro and Pineda (2002), Jacobo (2002), Aiolfi *et al*. (2006), Gutiérrez and Gómes (2009), González *et al*. (2012), and Jacobo and Marengo (2020).[1]

[1] Most of these studies use the H-P filter as a way to approach to the business cycles.

These works identify specific patterns and characteristics of business fluctuations in GDP and its components; their contributions are arguably best reviewed in Jacobo and Marengo (2020). For this reason — and to maintain conciseness — we have omitted a detailed discussion here. However, we deem it appropriate to briefly refer to studies that specifically consider MERCOSUR countries, particularly Argentina and Brazil.

Arnaudo and Jacobo (2020) conclude that the duration of MERCOSUR business fluctuations is variable and their degree of persistence over time is small. Additionally, they find that the relationship between GDP and its components (with the exception of Consumption) is quite modest. While the simultaneous associations in the macroeconomic behavior of these economies —best summarized through these variables— differ in magnitude and across time, they acknowledge a significant correlation between those of Argentina and Brazil

Mejía-Reyes (1999) finds some similarities between the fluctuations of Argentina and Brazil. However, the study concludes that business cycles are idiosyncratic and that macroeconomic policy coordination would not be applicable. Cerro and Pineda (2002) effectively identify long-term co-movements between the fluctuations of both countries, though they emphasize that some prior coordination is required to advance the integration process.

Although Jacobo (2002) identifies some common characteristics between Argentina and Brazil, he indicates that the economies have oscillated arrhythmically and concludes that there is little chance for the successful alignment of macroeconomic policies.

Regarding the study by Gutiérrez and Gómes (2009) — and despite some common characteristics they found — the business fluctuations of the countries are not synchronized, which would complicate the intensification of the integration agreement. Similarly, González *et al*. prompt reflection on the lack of complete synchronization and its consequences.

Finally, Jacobo and Marengo (2020) investigate whether economic fluctuations in Argentina and Brazil have followed a similar pattern. Although some characteristics of both economies clearly coincide, Argentina's business fluctuations are sharper and longer than Brazil's. The greatest concomitance is observed in GDP fluctuations; however, for the remaining components, coincidences drop to almost 50%. While Argentina's GDP and Consumption

exhibit a significant correlation with their Brazilian counterparts, the overall association remains quite modest.

3. Methodology

In order to find the business fluctuations, it is worth mentioning that it is possible to express a time series y_T as the sum of four unobservable components, as indicated by equation (1):

$$y_T = t_t + s_t + c_t + e_t \quad (1)$$

where t_t is the trend, and s_t is the seasonal, c_t the cyclical and e_t the irregular components (Enders, 1995). Since we are interested in the cyclical component, we simply need to remove the others.

To remove the seasonal component, the additive X-11 ARIMA model is used. As to irregular variations, they usually follow a random pattern and, because of their unpredictability, an attempt has not been made to study it mathematically. However, it should be noted that over a period of time, these random fluctuations tend to counteract each other and thus we may have a time series free of irregular variations (see Srivastava *et al*., 2005, p. 408).

To obtain the trend, and according to Kydland and Prescott (1990), we use the H-P filter. Formally, the trend component of the time series can be determined by solving the minimization problem indicated by equation (2):

$$\text{Min } \sum_{t=1}^{T} (y_t - \tau_t)^2 + \lambda \sum_{t=2}^{T-1} [(\tau_{t+1} - \tau_t) - (\tau_t - \tau_{t-1})]^2 \quad (2)$$

subject to: $\sum_{t=1}^{T} (y_t - \tau_t) = 0$; where y_t the original series to be filtered, τ_t the trend component and $c_t = y_t - \tau_t$ the cyclical component.

The first component of the minimization problem is the cyclical component measured as deviations from the long-term path (it is expected to be, on average, close to zero in a long run).

The second part of the equation represents the variability of the trend penalized by the parameter λ (lambda). The choice of the value of λ depends on

the frequency of the data. For quarterly data, Hodrick and Prescott propose to adopt the value of 1,600.

As noted by Jacobo and Marengo (2020), the H-P filter has a long history, and various shortcomings have been identified in the literature. While we will not delve into the details of its drawbacks here, it is pertinent to mention that this technique can lead researchers to report fake cyclical behaviors under certain circumstances, without straying too far from our main focus. Hamilton (2017) notably argued that the H-P filter should never be used, as it can result in spurious dynamics, exhibits end-point problems, and its typical implementation often contradicts its statistical foundations.

Notwithstanding criticisms, Ravn and Uhlig (2001) suggest that none of the filter's undesirable properties are particularly convincing and that the H-P filter has stood the test of time. Moreover, although elegant new band-pass filters have been developed, the H-P filter is likely to remain one of the standard methods for detrending. Empirical practice with the H-P filter almost universally relies on standard settings for the tuning parameter, which have largely been suggested by experimentation with macroeconomic data and exploratory reasoning. Its enduring appeal clearly stems from three main advantages. First, the filter can be used for estimating and removing long-term trends from macroeconomic time series. Second, a suitable filter bandwidth can be specified (via a fixed value of the smoothing parameter) for estimating trends with quarterly macroeconomic data. Third, it is important to highlight that the H-P filter facilitates easy comparison of results with other works that have adopted the same methodology.[2]

4. Estimation and results

The quarterly data series for the period 1997.I-2022.IV were obtained from the *International Financial Statistics* of the International Monetary Fund (IMF). Where necessary, the series were supplemented with data from the Economic Commission for Latin America and the Caribbean (ECLAC). Once seasonally adjusted, the H-P filter was applied.

For presentation purposes, the results have been divided into different subsections based on whether business fluctuations are analyzed independently

[2] See Jacobo and Marengo (2020).

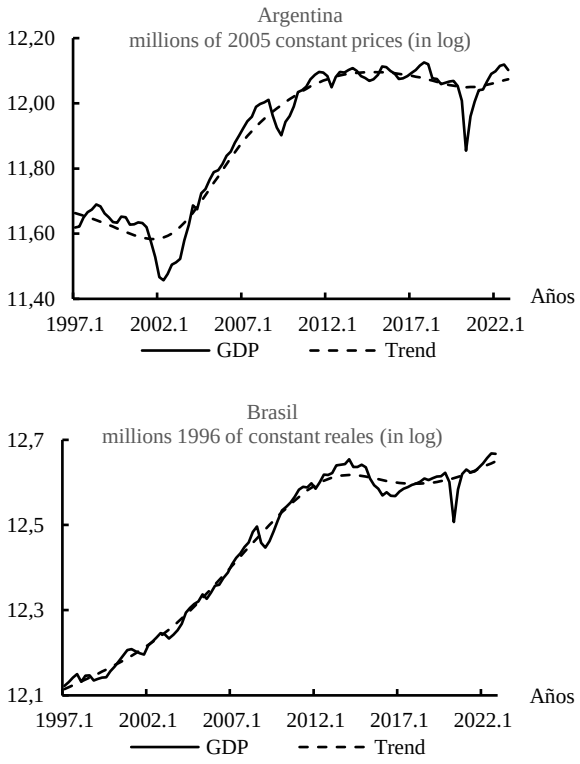
(subsection 4.1.) or jointly with the fluctuations of GDP components: Consumption (subsection 4.2.), Gross Capital Formation (subsection 4.3.), and the Trade Balance (subsection 4.4.).

4.1 Business fluctuations

Figure 1 shows the evolution of the real GDP of each economy and the corresponding trend that has been estimated using the H-P filter.

As shown, Argentina's macroeconomy exhibits the sharpest declines. The first occurred between 2001 and 2002, attributable to the banking and financial instability (known as the 'corralito bancario') during the final stages of the Convertibility Law. The subsequent decline took place between 2008 and 2009, primarily associated with the international financial crisis. Finally, a sharp collapse in GDP occurred in 2020, primarily caused by the pandemic, with COVID-19 generating a notable downturn (-18%) in the economy. Brazil's economy also experienced declines, though they were not as severe as Argentina's, highlighting a very remarkable difference between both economies

Figure 1 – Real GDP of Argentina and Brazil (1997.I -2022.IV)



Source: Own estimates based on data from the IMF and ECLAC.

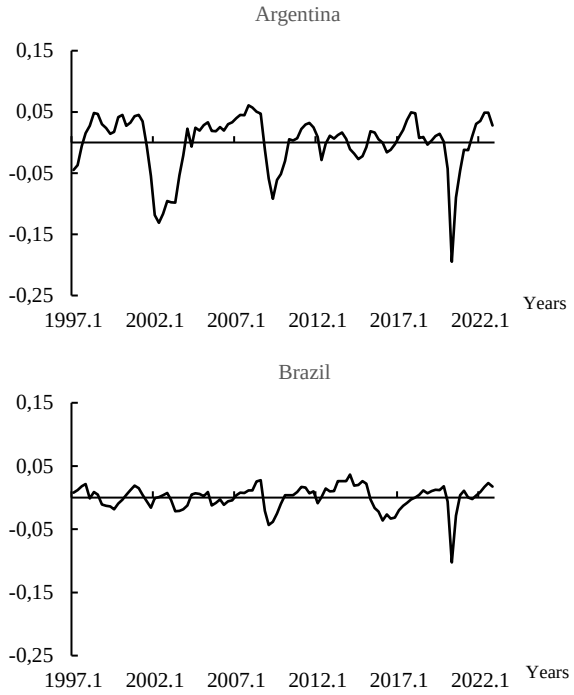
Figure 2 displays the business fluctuations of Argentina and Brazil. Argentina exhibits more pronounced and longer business fluctuations than Brazil. The volatility of these fluctuations (measured by the standard deviation) confirms that Argentina presents the greatest volatility (4.6%), an indicator considerably higher than that of Brazil (1.9%). In relative terms, Argentina is 2.4 times more volatile than Brazil. In comparison with previous studies, Argentina's volatility values remain consistent.

Regarding the coincidence of business fluctuations (i.e., the percentage of periods in which fluctuations are simultaneously positive or negative), the concomitance between Argentina and Brazil is 60%.

Co-movements refer to the simultaneous movements (or 'link') between the business cycle of one country and that of another (or between a country's cycle and the cyclical component of other variables). This link has become increasingly relevant with regional integration processes and is expected to strengthen as time goes by.

Table 1 presents the correlations between business fluctuations in both countries over time, considering lags up to two quarters. As shown, the correlation coefficient between Argentina and Brazil is 0.48.

Figure 2 – Cyclical fluctuations of Argentina and Brazil (1997.I -2022.IV)



Source: Own estimates based on data from the IMF and ECLAC.

Argentina´s contemporary GDP appears to be influenced by —and retains information from— two previous periods. This correlation is respectively 0.82 (first quarter) and 0.58 (second quarter). As to Brazil, these correlations are lower (0.64 and 0.28).

Table 1 – Argentina and Brazil: Cyclical correlation of GDP

GDP	ARG	ARG(-1)	ARG(-2)	BRA	BRA(-1)	BRA(-2)
ARG	1.00	0.82	0.58	0.48	0.33	0.12
ARG(-1)		1.00	0.82	0.28	0.47	0.32
ARG(-2)			1.00	0.10	0.27	0.46
BRA				1.00	0.64	0.28
BRA(-1)					1.00	0.63
BRA(-2)						1.00

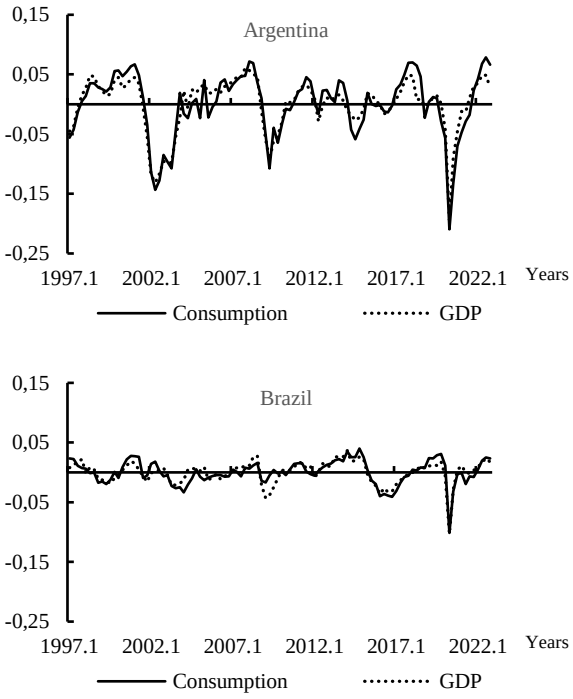
Source: own estimates based on data from the IMF and ECLAC.

Shortly, compared to previous studies, the results continue to show an interesting contemporary correlation between economies, and this is auspicious and theoretically expected in regional integration agreements.

4.2 Consumption

Figure 3 shows the fluctuations in Consumption and GDP. Notwithstanding common fluctuations are observed — it probably reveals a certain a greater degree of openness and a greater exposure to the crises and booms of its neighbors —, Consumption is more volatile in Argentina (5.3%) than in Brazil (2.0%).

Figure 3 – Argentina and Brazil: Cyclical fluctuations in Consumption and GDP (1997.I -2022.IV)



Source: Own estimates based on data from the IMF and ECLAC.

Table 2 provides information on the correlation of Consumption's fluctuations with GDP's. In this regard —and as expected—, Consumption is contemporaneously and highly correlated with GDP. Indeed, Argentina exhibits a higher correlation (0.93) than Brazil (0.86). Additionally, the correlation of

Consumption with the GDP's previous quarter is still significant for both countries (greater than or equal to 0.60).

Table 2 – Argentina and Brazil: Cyclical correlations of Consumption and GDP (1997.I -2022.IV)

Argentina

ARG	GDP	GDP(-1)	GDP(-2)	CON	CON(-1)	CON(-2)
GDP	1.00	0.82	0.58	0.93	0.75	0.50
GDP(-1)		1.00	0.82	0.82	0.94	0.75
GDP(-2)			1.00	0.61	0.82	0.94
CON				1.00	0.80	0.57
CON(-1)					1.00	0.80
CON(-2)						1.00

Brazil

BRA	GDP	GDP(-1)	GDP(-2)	CON	CON(-1)	CON(-2)
GDP	1.00	0.64	0.28	0.86	0.53	0.23
GDP(-1)		1.00	0.63	0.60	0.86	0.52
GDP(-2)			1.00	0.34	0.59	0.86
CON				1.00	0.65	0.36
CON(-1)					1.00	0.65
CON(-2)						1.00

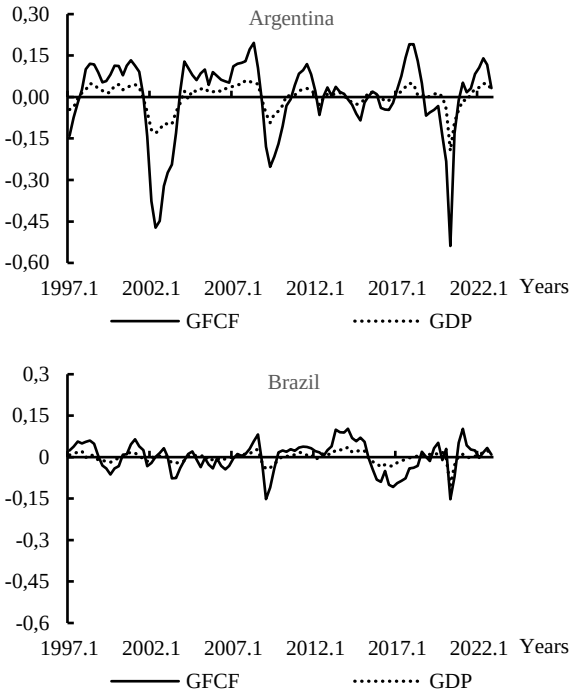
Source: own estimates based on data from the IMF and ECLAC

Finally, it should be noted that the coincidences in the cyclical fluctuations of Consumption for both economies are close to 60%. These results are the expected ones, and they are similar to those obtained in previous studies.

4.3 Gross Fixed Capital Formation

Cyclical fluctuations of Gross Fixed Capital Formation and GDP are shown in Figure 4. The volatility of this component is greater in Argentina (14.1%) than in Brazil (5.3%). Besides, Gross Fixed Capital Formation is more volatile than GDP in Argentina (3.07) than in Brazil (2.78).

Figure 4 – Argentina and Brazil: Cyclical fluctuations of Gross Fixed Capital Formation and GDP (1997.I -2022.IV)



Source: Own estimates based on data from the IMF and ECLAC.

Table 3 provides information on the correlations between cyclical fluctuations in Gross Fixed Capital Formation and GDP. As to this point, Gross Fixed Capital Formation — as Consumption — is contemporaneously and highly correlated with the GDP. This correlation is greater in Brazil (0.85) than in Argentina (0.82). The correlation of Gross Fixed Capital Formation with the GDP's previous quarter is still significant for both economies (above 0.60).

Table 3 – Argentina and Brazil: Cyclical correlations of Gross Fixed Capital Formation and GDP (1997.I -2022.IV)

Argentina

ARG	GDP	GDP(-1)	GDP(-2)	GFCF	GFCF(-1)	GFCF(-2)
GDP	1.00	0.82	0.58	0.95	0.84	0.64
GDP(-1)		1.00	0.82	0.75	0.95	0.85
GDP(-2)			1.00	0.51	0.76	0.95
GFCF				1.00	0.84	0.60
GFCF(-1)					1.00	0.84
GFCF(-2)						1.00

Brazil

BRA	GDP	GDP(-1)	GDP(-2)	GFCF	GFCF(-1)	GFCF(-2)
GDP	1.00	0.64	0.28	0.85	0.54	0.31
GDP(-1)		1.00	0.63	0.68	0.85	0.54
GDP(-2)			1.00	0.31	0.68	0.86
GFCF				1.00	0.72	0.39
GFCF(-1)					1.00	0.72
GFCF(-2)						1.00

Source: own estimates based on data from the IMF and ECLAC.

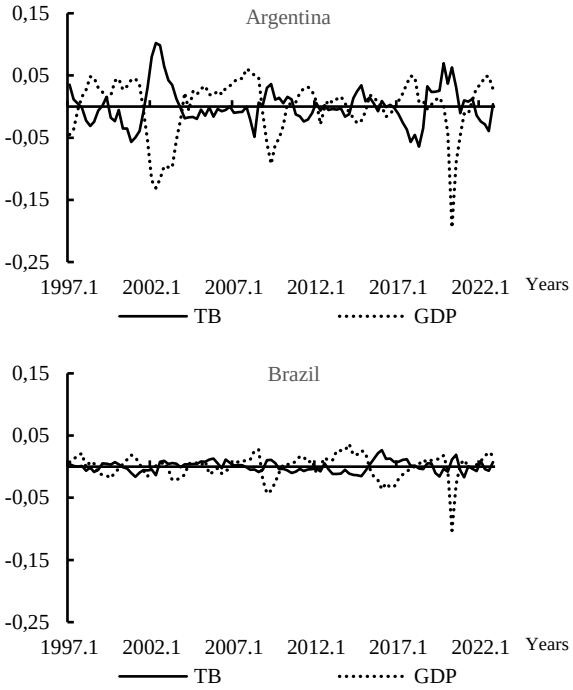
The coincidences in the cyclical fluctuations of Gross Fixed Capital Formation for both economies are equal to 56%.

4.4 Trade Balance

Figure 4 shows the cyclical fluctuations of the Trade Balance and those of GDP. Properly compared with the rest of GDP's components, the Trade Balance has the lowest volatility. However, the volatility is higher in Argentina (3.0%) than in Brazil (0.9%). As can be seen in the figure, the Trade Balance also acts countercyclically. As to the relative volatility, this is higher in Argentina (0,65) than in Brazil (0.45).[3]

[3] See Appendix.

Figure 5 – Argentina and Brazil: Cyclical fluctuations of Trade Balance and GDP (1997.I -2022.IV)



Source: Own estimates based on data from the IMF and ECLAC.

Table 4 – Argentina and Brazil: Cyclical correlations of Trade Balance and GDP (1997.I -2022.IV)

Argentina

ARG	GDP	GDP(-1)	GDP(-2)	TB	TB(-1)	TB(-2)
GDP	1.00	0.82	0.58	-0.78	-0.73	-0.60
GDP(-1)		1.00	0.82	-0.66	´0.78	0.60
GDP(-2)			1.00	-0.45	-0.66	-0.78
TB				1.00	0.78	0.56
TB(-1)					1.00	0.79
TB(-2)						1.00

Brazil

BRA	GDP	GDP(-1)	GDP(-2)	TB	TB(-1)	TB(-2)
GDP	1.00	0.64	0.28	-0.60	-0.41	-0.27
GDP(-1)		1.00	0.63	-0.59	-0.61	-0.41
GDP(-2)			1.00	-0.27	-0.61	-0.61
TB				1.00	0.62	0.32
TB(-1)					1.00	0.63
TB(-2)						1.00

Source: own estimates based on data from the IMF and ECLAC.

Table 4 provides information on the correlation of the cyclical fluctuations in the Trade Balance with those of GDP. The coincidence of the fluctuations in the Trade Balance between Argentina and Brazil is 56%.[4] The results obtained are related to what was pointed out in the literature. Toledo (2008) explains that the sources of these shocks in Latin American economies are the instabilities in the terms of trade and that the region is very vulnerable to these movements.

5. Concluding comments

This paper documents similarities in the economic fluctuations of the two main trading partners of MERCOSUR during the period 1997.I -2022.IV.

Argentina is the country with the greatest GDP instability, and its economy being nearly two and a half times more volatile than Brazil's. Regarding the coincidence of business fluctuations (i.e., the percentage of periods in which fluctuations are simultaneously positive or negative), the concomitance between Argentina and Brazil stands at 60%. Additionally, while Argentina's contemporary GDP retains information from two previous quarters, Brazil's current economic activity is only (and significantly) affected by the preceding one.

Concerning GDP components, Gross Capital Formation demonstrates the greatest volatility, whereas the Trade Balance exhibits the lowest volatility and acts countercyclically.

To summarize, and in line with previous studies, although Argentina and Brazil show some interesting concomitance by remaining simultaneously in the same phase of the economic cycle, the volatility of the Argentine macroeconomy, coupled with the weak correlation of cyclical fluctuations in both countries, suggests that successful application of homogeneous macroeconomic policies remains distant.

References

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[4] See Appendix.

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Appendix

Table A – Argentina and Brazil: Volatility and Coincidence pf GDP and its Components

Argentina	GDP	Consumption	GFCF	TB
Volatility %	4.6%	5.3%	14.1%	3.0%
Period +	66	62	66	45
Period -	38	42	38	59
Coincidences	100%	54.8%	57.7%	14.4%
Relative Volatility %	1	1.16	3.07	0.65

Brasil	GDP	Consumption	GFCF	TB
Volatility %	1.9%	2.0%	5.3%	0.9%
Period +	62	54	61	51
Period -	42	50	43	53
Coincidences	100%	46.2%	50.1%	20.2%
Relative Volatility %	1	1.07	2.78	0.45

Source: own estimates based on data from the IMF and ECLAC.

Table B – Argentina and Brazil: Correlation and Concomitance between GDP and its Components

Correlation	Argentina/Brazil	Concomitance	Argentina/Brazil
GDP	0.41	GDP	0.60
Consumption	0.38	Consumption	0.60
GFCF	0.38	GFCF	0.53
TB	0.29	TB	0.56

Source: own estimates based on data from the IMF and ECLAC.